BOARD OF INTERMEDIATE & SECONDARY EDUCATION, HYDERABAD

Excellence – Equity – Empathy

Time: **2 Hours** **MATHEMATICS MODEL PAPER (CLASS X)** Total Marks:**100**

Section A (Marks :50)

Multiple Choice Questions (MCQs)

Q1*: Choose the correct answer*.

(i) Set of rational numbers is subset of set of ---------- . . .
(a) natural numbers (b) real numbers (c) whole numbers (d) integers

(ii) One and only one line can pass through ---------- distinct points. .
(a) two (b) three (c) four (d)five

(iii) π is ---------- number.
(a) natural (b) even (c) rational (d) irrational

(iv) $\cot^2\theta+1=$ _____
(a) $\sin^2\theta$ (b) $\cos^2\theta$ (c) $\cos ec^2\theta$ (d) $\sec^2\theta$

(v) $\sqrt{x^3+2}$ is ---------- expression. .
(a) polynomial (b) rational (c)irrational (d) none of these

(vi) $(x-y)(x^2+xy+y^2)=$ ---------- .
(a) x^3+y^3 (b) $(x-y)^3$ (c) $(x+y)^3$ (d) x^3-y^3

(vii) $\sin 20^o=$ _____
(a) $\cos 70^o$ (b) $\cos ec70^o$ (c) $\cos 20^o$ (d) $\cos ec20^o$

(viii) Complement of 50^o is ---------- .
(a) 130^o (b) 40^o (c) -50^o (d) 90^o

(ix) Which of the following is a convex set.
(a) square (b) triangle (c) line (d) circle

(x) An isosceles triangle has ------ sides congruent..
(a) three (b) two (c) no (d)none of these

(xi) Exterior angle of a triangle is --------- than each of opposite interior angles..
(a)greater (b)less (c)equal or greater (d)equal or less.

(xii) Sum of all angles of quadrilateral is ----------. .
(a) 360^o (b) 180^o (c) 90^o (d) 40^o

(xiii) $(2x-1)(2x+1)=$----------
(a) $4x^2-2$ (b) $4x^2+2$ (c) $4x^2-1$ (d) $4x^2+1$

(xiv) Mantissa of logarithm can not be----------
(a) positive (b) negative (c) fraction (d) real

(xv) If $\log_2 x=3$ then $\log_2 x^2=$
(a) 9 (b) 5 (c)4 (d) 6

(xvi) $(x+y+z)(x^2+y^2+z^2-xy-yz-zx)=$----------
(a) $x^2+y^2+z^2+xy-yz-zx$ (b) $x^2+y^2+z^2-xy-yz-zx$
(c) $x^3+y^3+z^3-3xyz$ (d) $x^3-y^3-3xy(x-y)$

(xvii) A trapezium is a type of ---------- .
(a) rhombus (b) rectangle (c) parallelogram (d) quadrilateral

(xviii) A circle which passes through all the vertices of a triangle is called --------
(a)circumcircle (b) incircle (c)excircle (d) none of these

(xix) If $(x-2,1+y)=(-7,-2)$ then values of x and y are ---------- respectively.
(a) 5 and 3 (b) 3 and 5 (c) -5 and -3 (d) 1 and 0

(xx) The point $(-3,-5)$ is located in _____ quadrant.
(a) first (b) second (c) third (d) fourth

(xxi) The absicssa of any point on y-axis is always ----------
(a) non-zero (b) zero (c) negative (d) positive

(xxii) ---------- is additve identity in set of real numbers.

(a) 1 (b) 0 (c) -1 (d) none of these

(xxiii) The expression $y^2 \times 3x \div 8$ is ----------

(a) monomial (b) trinomial (c) binomial (d) all of these

(xxiv) The L.C.M of $2x^2y$ and $4x\ y^3$ is ----------

(a) $6x^3y^3$ (b) $6x^2y^2$ (c) $2x^2y^2$ (d) $4x^2y^3$

(xxv) $\begin{bmatrix} 6 & 0 \\ 0 & 8 \end{bmatrix}$ is --------- matrix.

(a) diagonal (b) scalar (c) unit (d) all of these

(xxvi) The determinant of singular matrix is ---------

(a) positve (b) negative (c) zero (d) non-zero

(xxvii) $(x+y)^2 + (x-y)^2 =$ ----------

(a) $2(x+y)^2$ (b) $x^2 + y^2$ (c) $2(x^2 + y^2)$ (d) 4xy

(xxviii) The solution set of $|x-4| = 8$ is----------

(a) $\{-4, 12\}$ (b) $\{4, -12\}$ (c) $\{-16, 2\}$ (d) none of these

(xxix) The solution set of $\sqrt{x} = -8$ is----------

(a) $\{8\}$ (b) $\{16\}$ (c) $\{64\}$ (d) $\{\ \}$

(xxx) The sum of two supplementary angles is equal to ------- degrees

(a) 90 (b) 180 (c) 360 (d) 100

(xxxi) A line which cuts cirlce at two distinct points is called ----------

(a) diameter (b) tangent (c) secant (d) chord

(xxxii) $\dfrac{\sqrt{169} - \sqrt{121}}{\sqrt{16}} =$ ---------

(a) 2 (b) $\dfrac{1}{2}$ (c) 1 (d) none of these

(xxxiii) A chord which passes through the centre of a circle is called ----------

(a) secant (b) diameter (c) tangent (d) radius

(xxxiv) Factors of $x^3 - 8y^3$ are ----------

(a) $(x-y)(x^2 + xy + y^2)$ (b) $(x+2y)(x^2 - 2xy + 4y^2)$

(c) $(x-2y)(x^2 + 2xy + 4y^2)$ (d) $(x-2y)(x^2 + 2xy + 2y^2)$

(xxxv) If $\log_x 64 = 3$ then x is equal to ------

(a) 4 (b) 8 (c) 6 (d) 16

(xxxvi) The side opposite to right angle in a triangle is called ---------

(a) perpendicular (b) hypotenuse (c) base (d)altitude

(xxxvii) Fundamental agreements related to numbers are called ----------

(a) theorems (b) corollaries (c) postulates (d) axioms

(xxxviii) $\tan^2\theta + 1 =$.--------

(a) $\cot^2\theta$ (b) $\cos^2\theta$ (c) $\sec^2\theta$ (d) $\sin^2\theta$

(xxxix) If two non-parallel lines of different planes , fail to intersect are -------

(a) parallel lines (b)intersecting lines (c) skew lines (d) none of these

(xl) $\dfrac{\sqrt{3}}{2}$ is the value of ----------

(a) $\sin 60^\circ$ (b) $\cos 30^\circ$ (c) $\tan 45^\circ$ (d) both a & b

(xli) $x + 2 = 0$ is ---------- equation.

(a) quadratic (b) linear (c)non-linear (d) irrational

(xlii) If $R = \{(2,5), (3,6), (4,7)\}$ then domain of R is -------

(a) $\{5, 6, 7\}$ (b) $\{1, 2, 3\}$ (c) $\{2, 3, 4\}$ (d) none of these

(xliii) Tabular form of $\{x \mid x \in Z \wedge -2 < x < 2\}$ is .

(a) $\{-1, 0, 1\}$ (b) $\{-2, -1, 0, 1, 2\}$ (c) $\{0, 1, 2\}$ (d) none of these

(xliv) $\sqrt{2} + 3$ is a binomial -------

(a) expression (b) polynomial (c)equation (d) surd

(xlv) $(x-2)(x+3) =$ ---------

(a) x^2+x+6 (b) x^2+x-6 (c) x^2-x-6 (d) x^2-x+6

(xlvi) The H.C.F of a^3-b^3 *and* a^6-b^6 is ---------

(a) $a-b$ (b) a^2-b^2 (c) a^3-b^3 (d) a^6-b^6

(xlvii) If $A=\begin{bmatrix}1 & 0\\ 0 & 1\end{bmatrix}$ then $A^{-1} =$ --------

(a) $\begin{bmatrix}-1 & 0\\ 0 & -1\end{bmatrix}$ (b) $\begin{bmatrix}0 & 1\\ 1 & 0\end{bmatrix}$ (c) $\begin{bmatrix}0 & -1\\ -1 & 0\end{bmatrix}$ (d) $\begin{bmatrix}1 & 0\\ 0 & 1\end{bmatrix}$

(xlviii) A perpendicular from the vertex of a triangle to the opposite side is called--------.

(a) median (b) right bisector (c) altitude (d) transversal

(xlix) The common logarithm has the base _____

(a) π (b) e (c)10 (d) 0

(L) If $x+\frac{1}{x}=2$ then $x^2+\frac{1}{x^2} =$ ----------

(a) 0 (b) 2 (c) 4 (d)6

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Time: **2 Hours** **MATHEMATICS MODEL PAPER (CLASS X)** Total Marks:**100**

Section B (Marks :30)

Note: Attempt any FIVE from the following .Each question carries 6 marks.

Q.2 If $A=\{a,b,c\}$ and $B=\{x,y\}$ .then find:

(i) a function from A to B which is onto.

(ii) three relations in $B\times A$

Q.3 Simplify : $\sqrt{\dfrac{(216)^{\frac{2}{3}}(25)^{\frac{1}{2}}}{\left(\frac{1}{25}\right)^{\frac{-3}{2}}}}$

Q.4 Find the value of $\dfrac{57.26}{\sqrt[3]{0.382}}$ using logarithms.

Q.5 For what value of k ,the expression $x^3+x^2-14x-k$ is exactly divisible by $x+2$?

Q.6 If $a+\dfrac{1}{a}=2$ .then prove that $a^2+\dfrac{1}{a^2}=a^4+\dfrac{1}{a^4}=a^3+\dfrac{1}{a^3}$

Q.7 Factorize any two : (i) a^4+a^2+1 (ii) $12x^2-13x+3$ (iii) $x^{12}-y^{12}$

Q.8 For what values of p and q , $4x^4+12x^3+25x^2+px+q$ will be a perfect square?

Q.9 Solve : $\dfrac{1}{y+4}-\dfrac{1}{y-4}=4$

Q.10 Apply Cramer's rule to solve the system :

$$2x+3y=-3$$
$$4x+3y=5$$

Q.11 Eliminate x from the given equations : $x+\dfrac{1}{x}=2p$; $x-\dfrac{1}{x}=2q+1$

Section C (Marks :20)

Note: Attempt any TWO from the following. Each question carries 10 marks.

Q.12 The sum of the measures of the angles of a triangle is 180^o.Prove it.

Q.13 Prove that $\dfrac{\cos\theta}{1+\sin\theta}=\dfrac{1-\sin\theta}{\cos\theta}$ .Also verify that $\dfrac{1-\tan^2 30^o}{1+\tan^2 30^o}=1-2\sin^2 30^o$

Q.14 Find the values of the trigonometric ratios of 30^o

Q.15 Construct a ΔABC in which $m\overline{BC}=3.7cm, m\overline{AB}=5.3cm$ *and* $m\angle A=40^o$

Also define inscribed circle with the help of figure.

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Time: **2 Hours** **PHYSICS MODEL PAPER (CLASS X)** Total Marks: **85**

SECTION A

Marks 41

MULTIPLE CHOICE QUESTIONS (MCQs)

Q.No: 1 (1) Attempt all questions. Each question carries 1 mark. Write answer in full on the first specified page of answer copy with choose (ABC & D)

(i) _____ deals with the motion of objects with or without reference of force.
(a) Electricity (b) Mechanics (c) Bio- Physics (d) Atomic Physics

(ii) Science is the common _____ of all mankind.
(a) Heritage (b) Energy (c) Physics (d) Law

(iii) The only Noble Prize holder from Pakistan is _____.
(a) Dr. Abdul Qadeer Khan (b) Dr. Abdus Salam
(c) Dr. Samar Abbas (d) Dr. Saleem uz Zaman.

(iv) In a scientific work the most important thing is _____.
(a) Theory (b) Law (c) Observation (d) Hypothesis

(v) The fundamental unit of length in S.I system is _____.
(a) Kilometer (b) Meter (c) Yard (d) Foot

(vi) One meter is equal to _____.
(a) 10^4 mm (b) 10^3 mm (c) 10^2 mm (d) 10^6 mm

(vii) Rate of change of velocity of a body is known as_____.
(a) Speed (b) Time (c) Acceleration (d) Density

(viii) The shortest distance between the initial and final positions of body is called_____.
(a) Position (b) Displacement (c) Distance (d) Speed

(ix) First equation of motion is _____.
(a) $t = Vf - Vi$ (b) $Vf = Vi + at$ (c) $a = Vf - Vi$ (d) $Vf - Vi = at$

(x) The unit of coefficient of friction is _____.
(a) Newton (b) Kilogram (c) Metre (d) None

(xi) The S.I unit of force is _____.
(a) Metre (b) m /sec (c) Kg (d) Newton

(xii) The product of mass and velocity is called its _____.
(a) Momentum (b) Weight (c) Speed (d) Velocity

(xiii) The quantity of matter in a body is called its _____.
(a) Speed (b) Mass (c) Weight (d) Force

(xiv) _____ is a scalar quantity.
(a) Torque (b) Distance (c) Momentum (d) Acceleration

(xv) _____ is a vector quantity.
(a) Work (b) Density (c) Velocity (d) Temperature

(xvi) Torque is a _____.
(a) Scalar Quantity (b) Vector Quantity (c) Negative Quantity (d) None of these

(xvii) The unit of torque in S.I Units is _____.

(a) Newton (b) Meter (c) Newton Metre (d) Pound

(xviii) The turning effect of a force about an axis is

(b) Force (b) Rotation (c) Torque (d) Momentum

(xix) "G" is called_____.

(a) Gravity (b) Gravitational Force

(c) Gravitational Acceleration (d) Gravitational Constant

(xx) The work will be positive? If the angle between force and displacement is _____.

(a) 90^0 (b) $45^{\circ 0}$ (c) 180^0 (d) 0^0

(xxi) The energy possessed by a body due to its position is called_____.

(a) Kinetic Energy (b) Heat Energy(c) Potential Energy (d) Sound Energy

(xxii) Rate of doing work with respect to time is called _____.

(a) Work (b) Distance (c) Power (d) Energy

(xxiii) Ability of a body to do work is called _____.

(a) Power (b) Energy (c) Velocity (d) Heat

(xxiv) Power is the product of _____ and velocity.

(a) Force (b) Power (c) Energy (d) Work

(xxv) Energy is a_____ quantity

(a) Vector (b) Scalar (c) Positive (d) Negative

(xxvi) A pair of scissors is an example of a_____.

(a) Pulley (b) Lever (c) Wheel and axle (d) Inclined Plan

(xxvii) _____ is a wheel type disc

(a) Pulley (b) Lever (c) Wheel (d) In Put

(xxviii)The Product of Load and Load Arm is called _____

(a) Moment of Effort (b) Fulcrum (c) Lever (d) Moment of load

(xxix) Elasticity of a substance depends on its.

(a) Temperature (b) Heat (c) Nature (d) Size

(xxx) Archimedes principle is applied to determine _____

(a) Specific Heat (b) Specific Gravity (c) Specific Resistance (d) Temperature

(xxxi) Random motion of molecules in a fluid was first discovered by _____.

(a) Robert Boyle (b) Robert Brown (c) Newton (d) Robert Hooke

(xxxii) An object appears lighter in water because of one of the properties of water _____.

(a) Buoyancy (b) Surface Tension (c) Viscosity (d) Nature

(xxxiii)_____ is the form of Energy.

(a) Heat (b) Temperature (c) Power (d) Weight

(xxxiv)Light travels in a ____ line.

(a) Straight (b) Vertical (c) Positive (d) Negative

(xxxv) Light is the form of _____.

(a) Power (b) Energy (c) Real (d) Mirror

(xxxvi) If q = 4 cm and p = 2 cm, then the magnification of the mirror is _____.

(a) 2 (b) 0.5 (c) 6 (d) 4

(xxxvii) The speed of light is _____ m /sec

(a) 3×10^6 (b) 3×10^8 (c) 1.86×10^6 (d) 3×10^{10}

(xxxviii) Which one of the equivalent to "Joule per Coulomb"

(a) Ampere (b) Ohm (c) Volt (d) Watt

(xxxix) One mega ohm resistance is equal to _____ ohm.

(a) 10^6 (b) 10^{-6} (c) 10^8 (d) 10^2

(xl) _____ revolve around the nucleus in their respective orbits.

(a) Neutrons (b) Protons (c) Electron (d) Deuteron

(xli) 100^oc = _____ k.

(a) 373 (b) 273 (c) 150 (d) 270

SECTION B

24 Marks

SHORT ANSWERS

NOTE: Attempt any four of the following question. Each carries 06 marks.

Q.No:2 Explain the word Physics and define what is Physics?

Q.No:3 What is Law of Gravitation?

Q.No:4 Drive the Equation $2aS=vf^2-vi^2$

Q.No:5 Define the branches of Physics? Any Four .

Q.No:6 What is a Lever? Determine its mechanical advantage.

Q.No:7 Determine the acceleration of a car of mass 900kg,when a net force of 2700N acts on it.

Q.No:8 Differentiate between mass and weight?

SECTION "C"

(LONG ANSWER)

NOTE: Answer any TWO of the following questions. Each carries 10 marks. **(20 Marks)**

Q.No:09 How can we determine the mass of the earth by applying law of Gravitation?

Q.No:10 Explain series and parallel combination for resistance.

Q.No:11 What type of work is done by a movable pulley?

Q.No:14 Write notes on any Two of the following:

(i) Newton's Second Law of Motion

(ii) Resolution of Vector

(iii) Centripetal Force